# Disposable Fieldable Negative Pressure Device

Negative pressure wound treatment is an established method for helping tissue heal faster, but current treatment devices are large and expensive, built for use in hospitals. To make sure their patients could benefit from the technique, military doctors on the USS Comfort and at the Expeditionary Medical Facility in Kuwait jury-rigged their own versions. Seeing this, a commander with the Naval Medical Center, Portsmouth, Va., recognized the need for a rugged and portable system. She applied for help from the Office of Naval Research's Tech Solutions program, which provides Sailors and Marines with a web-based system to request solutions to their technology needs.

The Tech Solutions program provided funding to the Naval Surface Warfare Center Dahlgren Division to develop a prototype. Because interruption of the treatment can increase the risk of infection and limit its effectiveness, the new device is designed to be applied at the earliest opportunity, such as a field hospital, and to operate throughout the medical evacuation process. The device could reduce the likelihood of permanent adverse effects, convalescent time, and treatment cost.

Negative pressure wound therapy applies a negative (vacuum) pressure to an acute or chronic wound to prevent bacterial infection or wound degradation and thus helps tissue heal more quickly. Wounds treated with this therapy heal 40 to 60 percent more quickly than those treated with gauze dressing.

Called the Disposable Fieldable Negative Pressure Device, or DFND, the compact system includes a dressing connected by tubing to a vacuum source and a canister to collect wound exude. Depending on wound size, up to three wounds can be treated simultaneously with a single device.

Each DFND can be used for a maximum of seven days, when it must be replaced due to health regulations. It can be powered by off-the-shelf batteries or a BA-5590 field radio battery—or even a hand pump. Visible and audible alarms indicate abnormal conditions, including: a high fluid level in the collection canister, excessively high or low vacuum pressure, high wound exude flow rate, and low battery power.

The DFND will maintain the necessary vacuum when positioned in many orientations, allowing a variety of patient activity. It will perform best if the patient remains in a 90-degree window between standing up and lying flat. The system's simple operating controls can be maintained by ambulatory patients or out-patients after minimal training.

The Naval Surface Warfare Center Dahlgren received ONR Tech Solutions funding for the project on March 31, 2006, and in October 2006 delivers the first prototype for testing.

## Specifications:

Volume: ~ 500 ml
Diameter: 6 inches
Device Weight: <4 lbs
Height: 8 inches
Developer: NWSC Dahlgren